East Waterway Anthropogenic Background

Meeting #4
EW Laterals, LDW Laterals, LDW Bed Loads

Presented by

East Waterway Group

October 7, 2020

Meeting Agenda

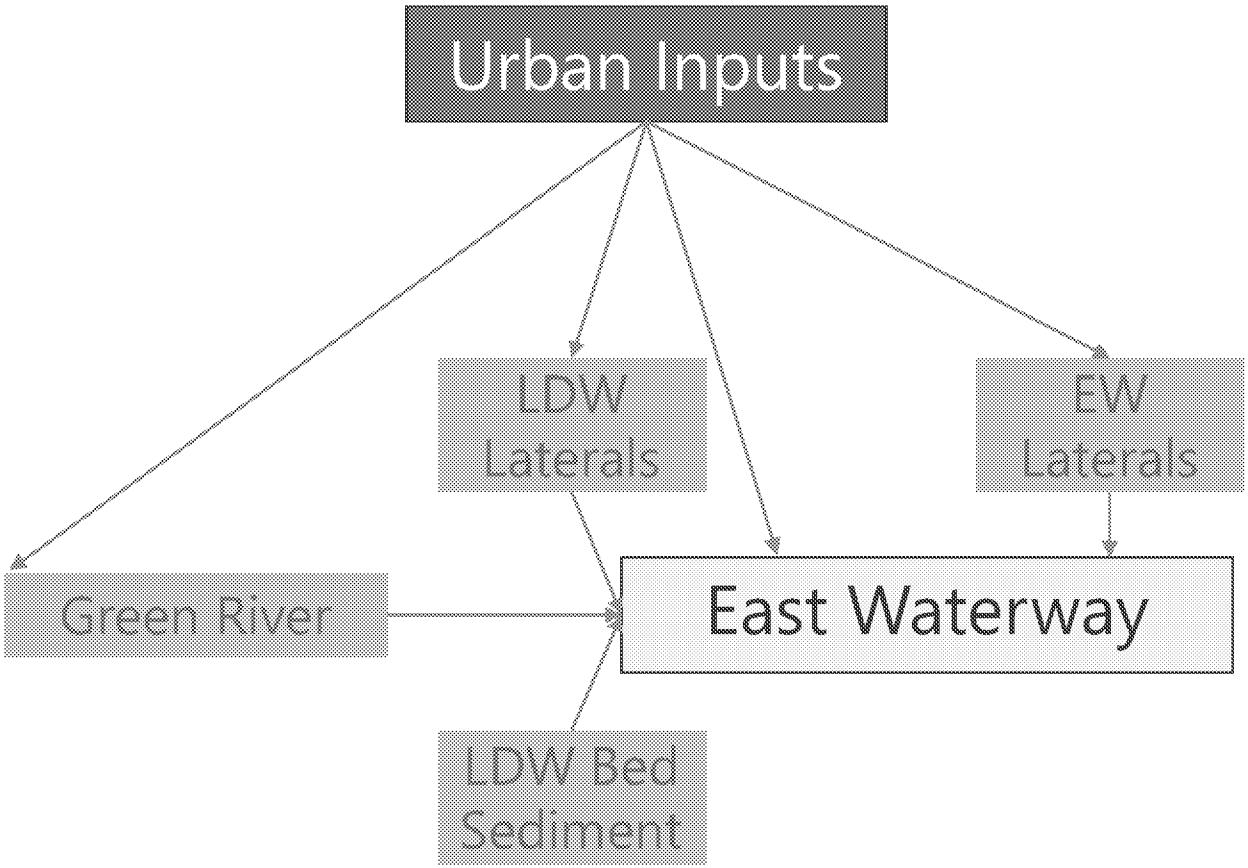
- Urban Inputs
- EW and LDW Drainage Basins
- Source Control Work
- Data Summaries
- LDW Bed
- Data Sufficiency Meeting

Purpose

- From Meeting Series Agendas
  - Identify how existing data can be used to develop AB
- Secondary Purpose
  - Document the factors affecting EW long-term concentrations within the context of AB development

Urban Inputs

Anthropogenic Inputs to the EW

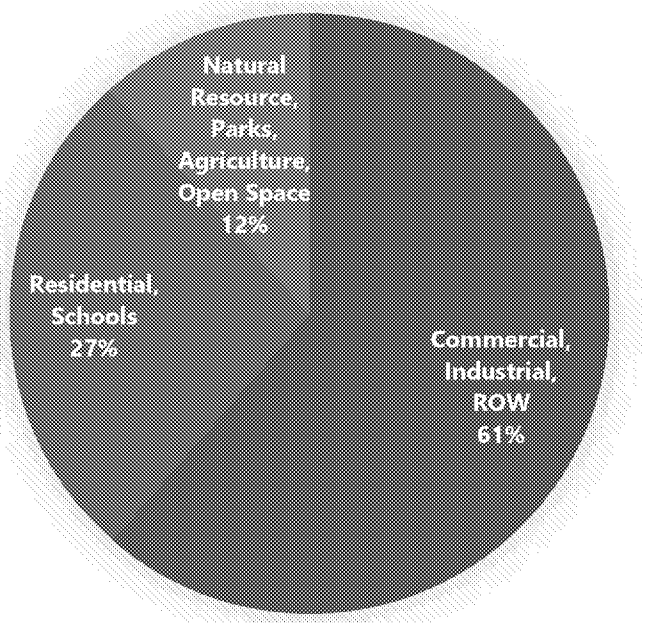


Urban Inputs in Anthropogenic Background

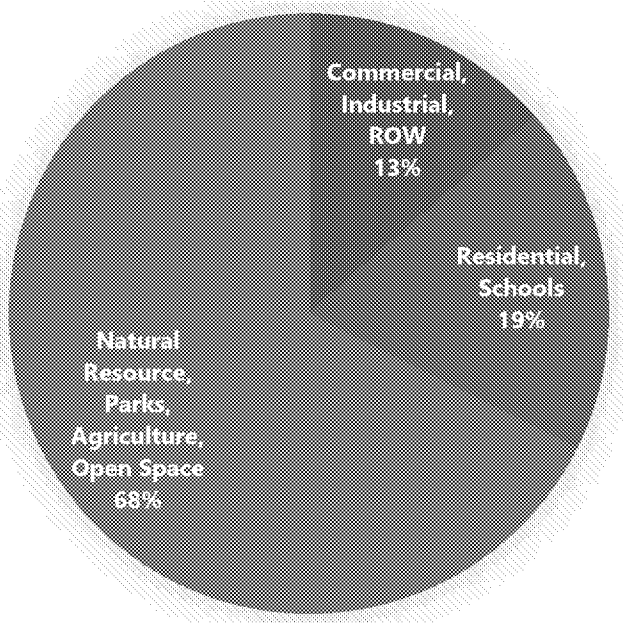
- Use of EW and LDW Lateral Data
  - Current lateral data include sources that are still undergoing source control actions
  - Source control sufficiency is a required element for all EW and LDW direct discharge and upland cleanups prior to sediment cleanup actions
  - The best estimate of urban inputs of the direct drainage basins to the EW and LDW is represented by inputs following source control
  - How can urban inputs following source control be estimated with available lateral data?

EW and LDW Drainage Basins

EW and LDW Lateral Drainage Basins (SDs and CSOs) 21,000 acres

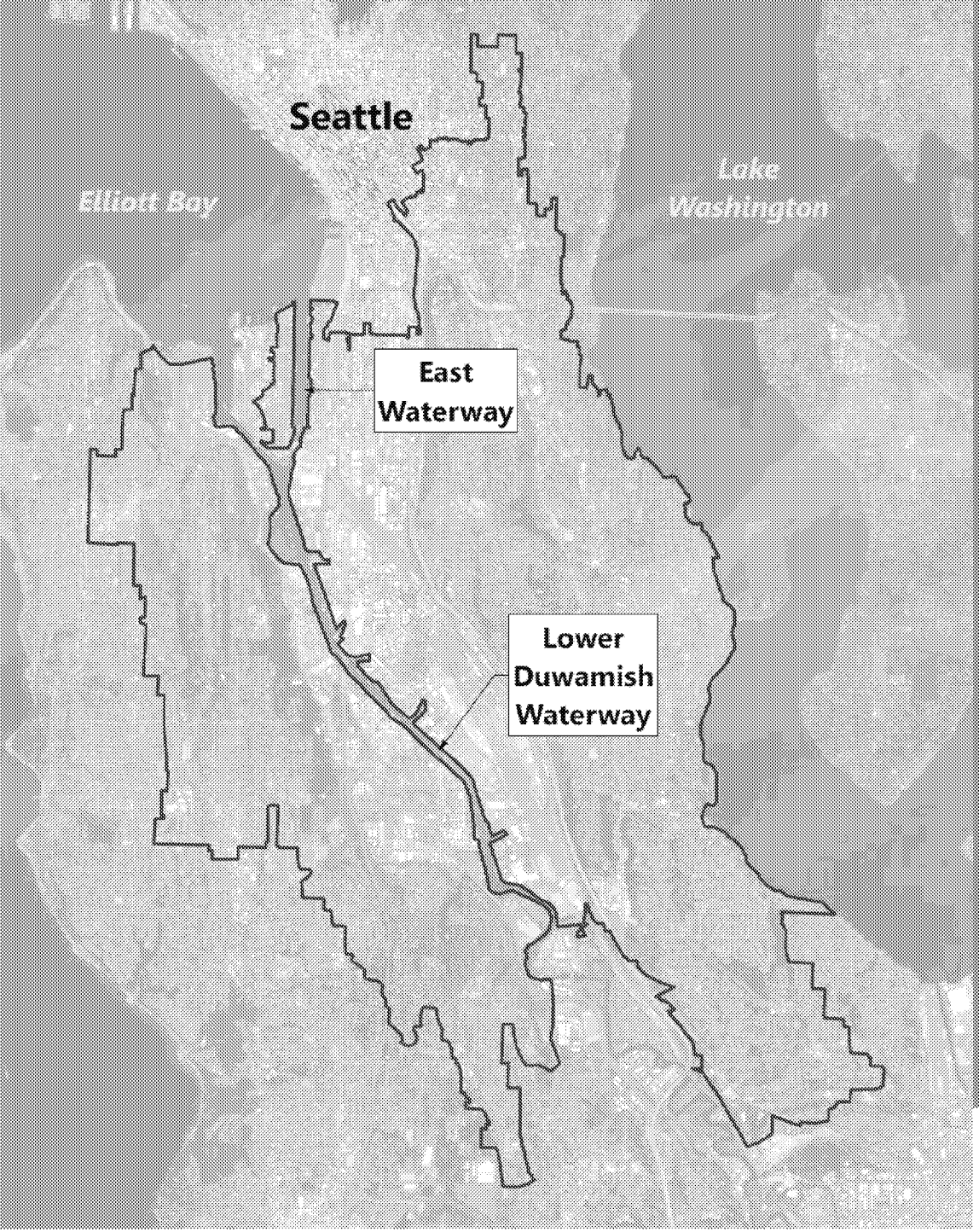


Green River Drainage Basin (Foster Links) 294,000 acres



Sources: LDW RI, EW SRI, King County 2018

- EW and LDW basins include 13,000 acres of commercial, industrial, and rights-of-way within Seattle's industrial corridor
- EW and LDW drainage basins include areas of higher density development and longer history of development when compared to than Green River developed land



EW and LDW Drainage Basins

EW Outfall Summary

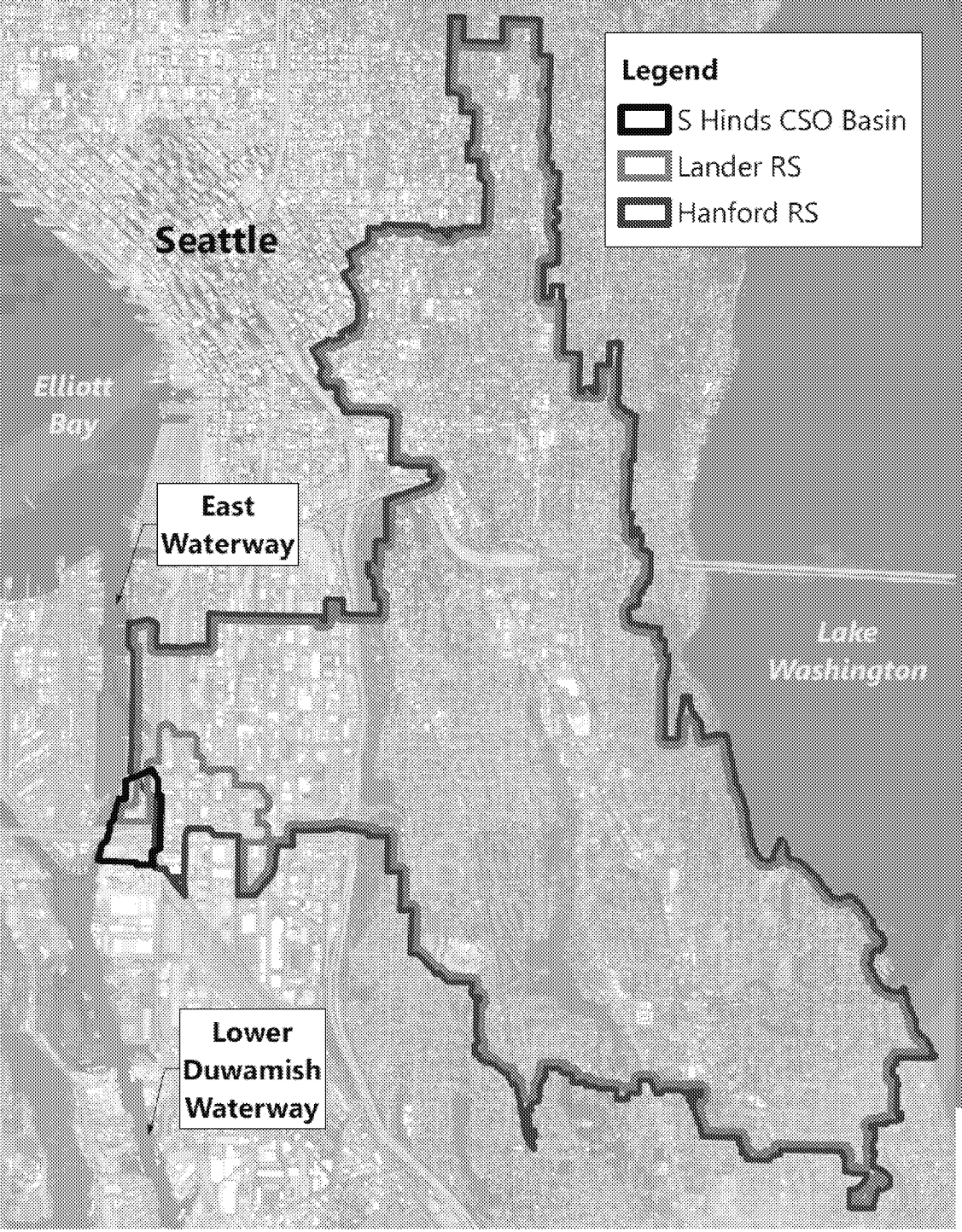
- CSOs (3 outfalls):
  - Hinds CSO (City)
  - Lander CSO (King County)
  - Hanford #2 CSO (King County)
- Storm Drains (41 outfalls):
  - City of Seattle Basins, Roadways, Bridges (S. Lander is the largest)
  - Port of Seattle Basins and Deck Drains
  - US Coast Guard
  - Olympic Tug and Barge

EW CSOs

Basin Land Use Areas (Rounded Acres)

Land Use	Hanford #2/ Lander	Hinds	Total
Commercial, Industrial, ROW	2,800	52	2,900
Residential	1,700	0	1,700
Park, open space, other	400	5	400
Total	**5,000**	**56**	**5,000**

- Lander CSO basin is similar size as Hanford #2 CSO basin because of large areas of shared drainage
- Lander and Hanford #2 CSO basins represent 99% of CSO basin areas
- CSOs discharge only during large storm events (~90%+ stormwater)



EW CSO Basins

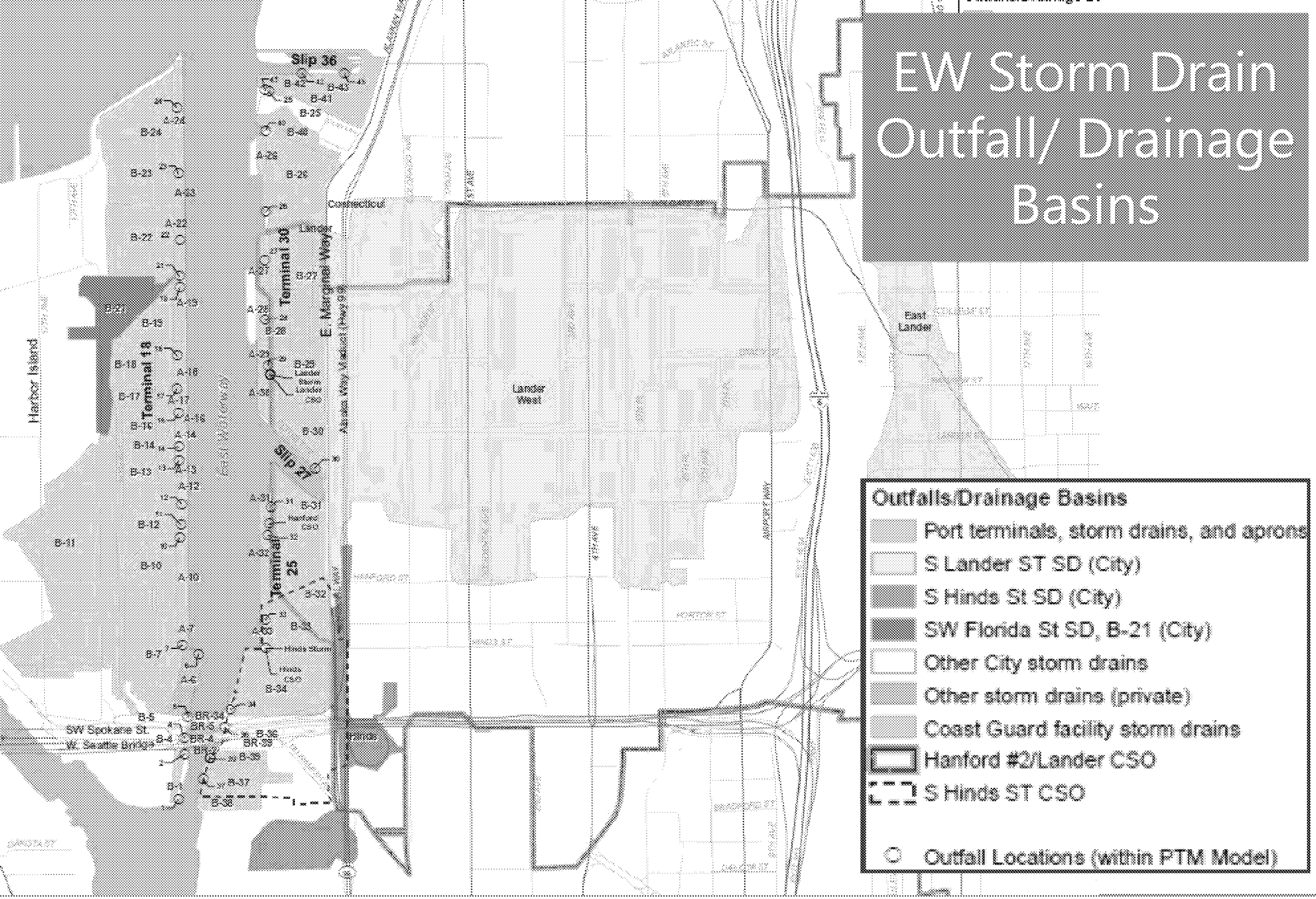
EW Storm Drains

Basin Land Use Areas (Acres)

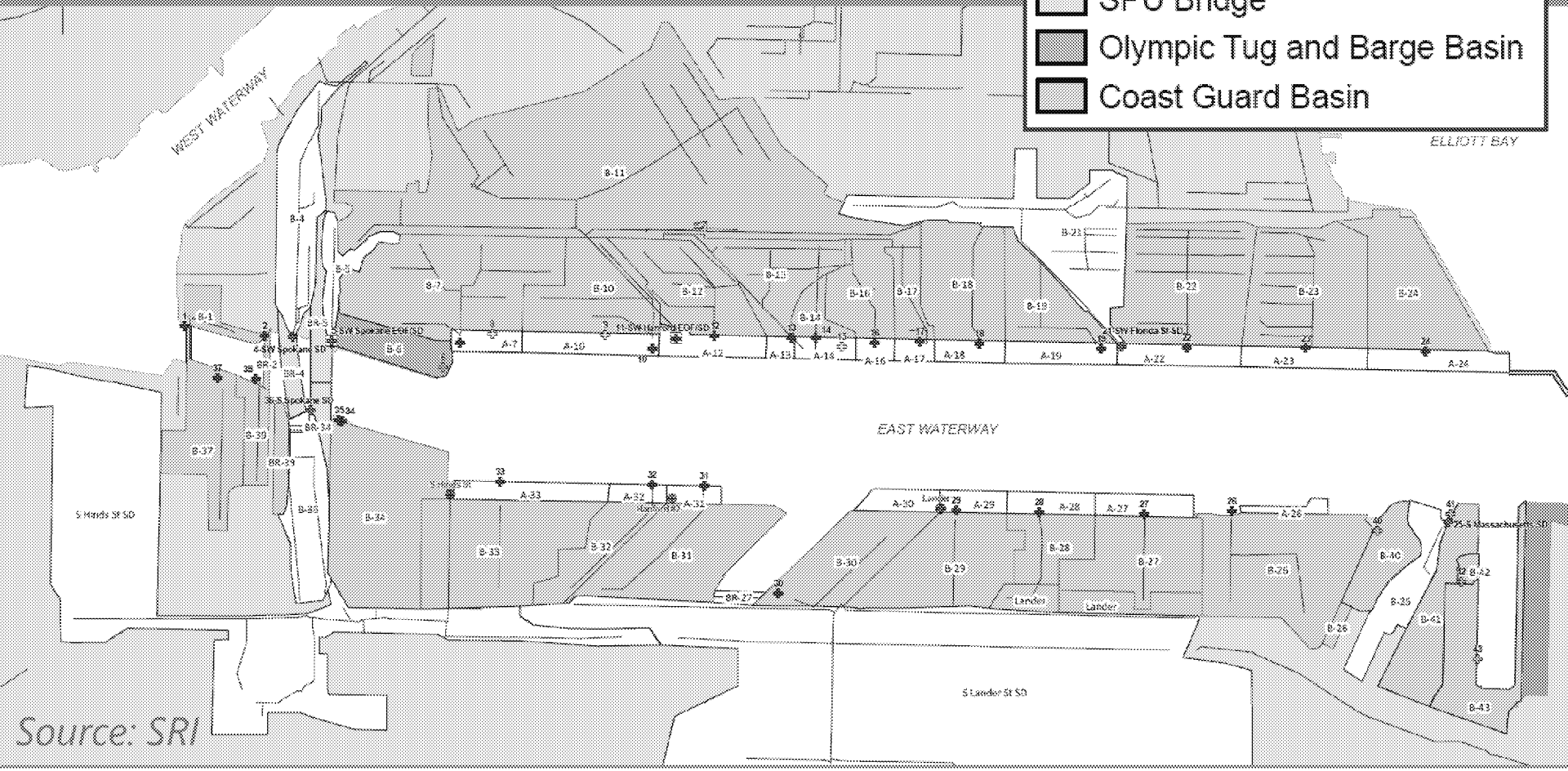
Land Use	S Lander Street SD	Nearshore Drainage Areas	Apron Areas	Bridge Areas	Total
Commercial, Industrial, ROW	404	312	28	6	750
Residential	35	0	0	0	35
Park, open space, other	3	0	0	0	3
Total	**442**	**312**	**28**	**6**	**788**

- S. Lander Street SD represents >1/2 of the total storm drainage basin area
- Nearshore drainage areas (primarily Port terminals) > 1/3 of total storm drainage basin area
- Storm drains discharge during every precipitation event

EW Storm Drain Outfall/ Drainage Basins



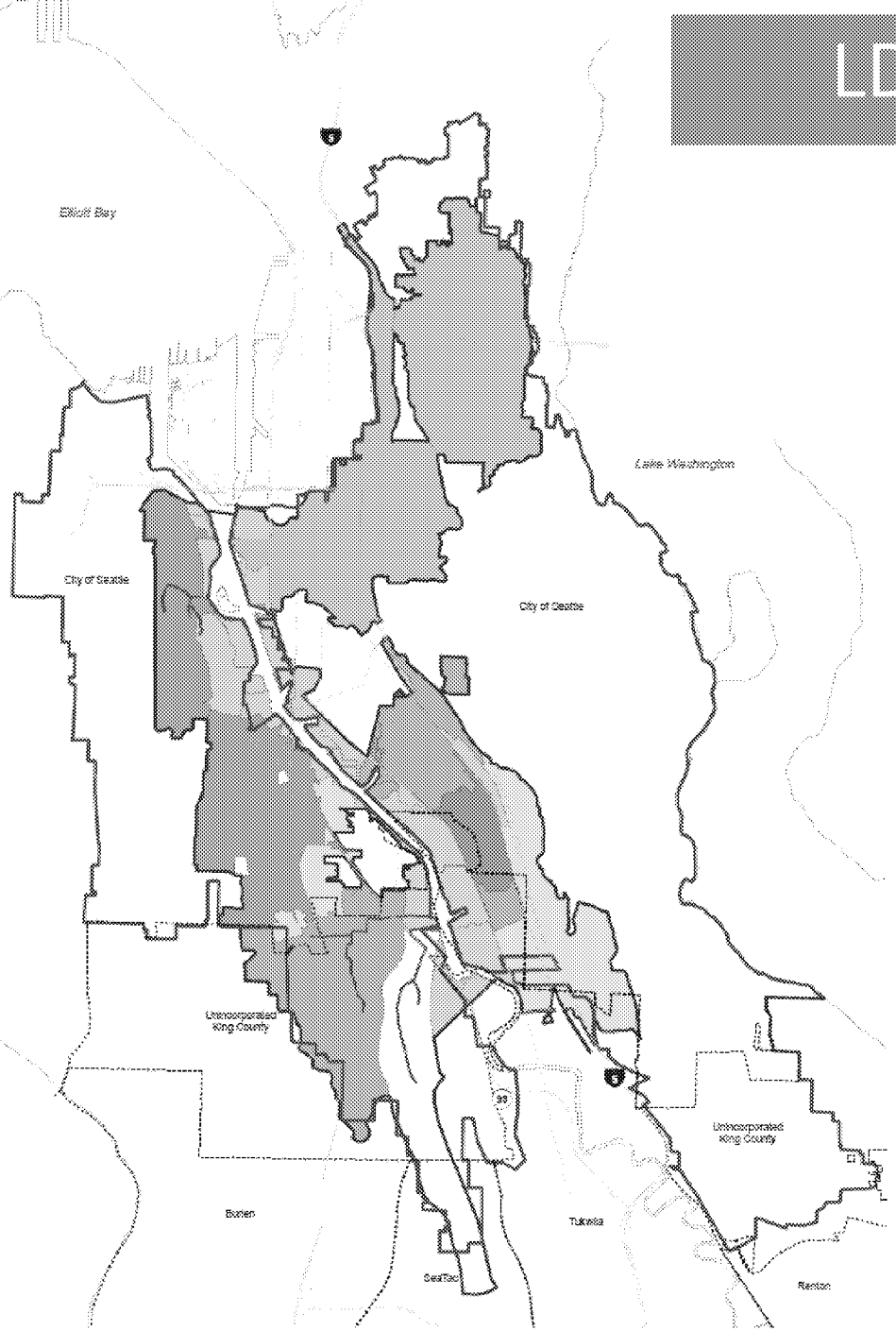
EW Storm Drains



LDW Outfall Summary

- 208 direct discharge points
- 203 are public or private outfalls
- 5 are ditches, creeks, or streams

LDW Drainage Basins



- Combined sewer service area discharging to the LDW
- Greater LDW surface drainage basin
- Diagonal Ave S CSO/SD
- Norfolk SD
- Slip 4
- 7th Ave S SD
- West side public SDs
- Hamm Creek
- Central KCIA
- South KCIA
- Remaining east side public SDs
- S 96th St SD
- Glacier Bay/SW Kenny SD
- Private waterfront drains
- Road
- Creek
- City boundary

Source: LDW RI (Windward 2010)

LDW SDs

- The City of Seattle's municipal storm drain system services 61% of the LDW SD drainage basin, which is a separated or partially separated storm drain system.
- Unincorporated King County and City of Tukwila municipal storm drains service 24% of the drainage basin
- Private waterfront storm drain systems service the remaining 15% of the drainage basin

Source: LDW RI (Windward 2010)

LDW CSO Summary

- 10 CSOs
- 5 Emergency Overflows (EOFs)
- 5 CSOs remain to be controlled (by 2030)

Source Control Work

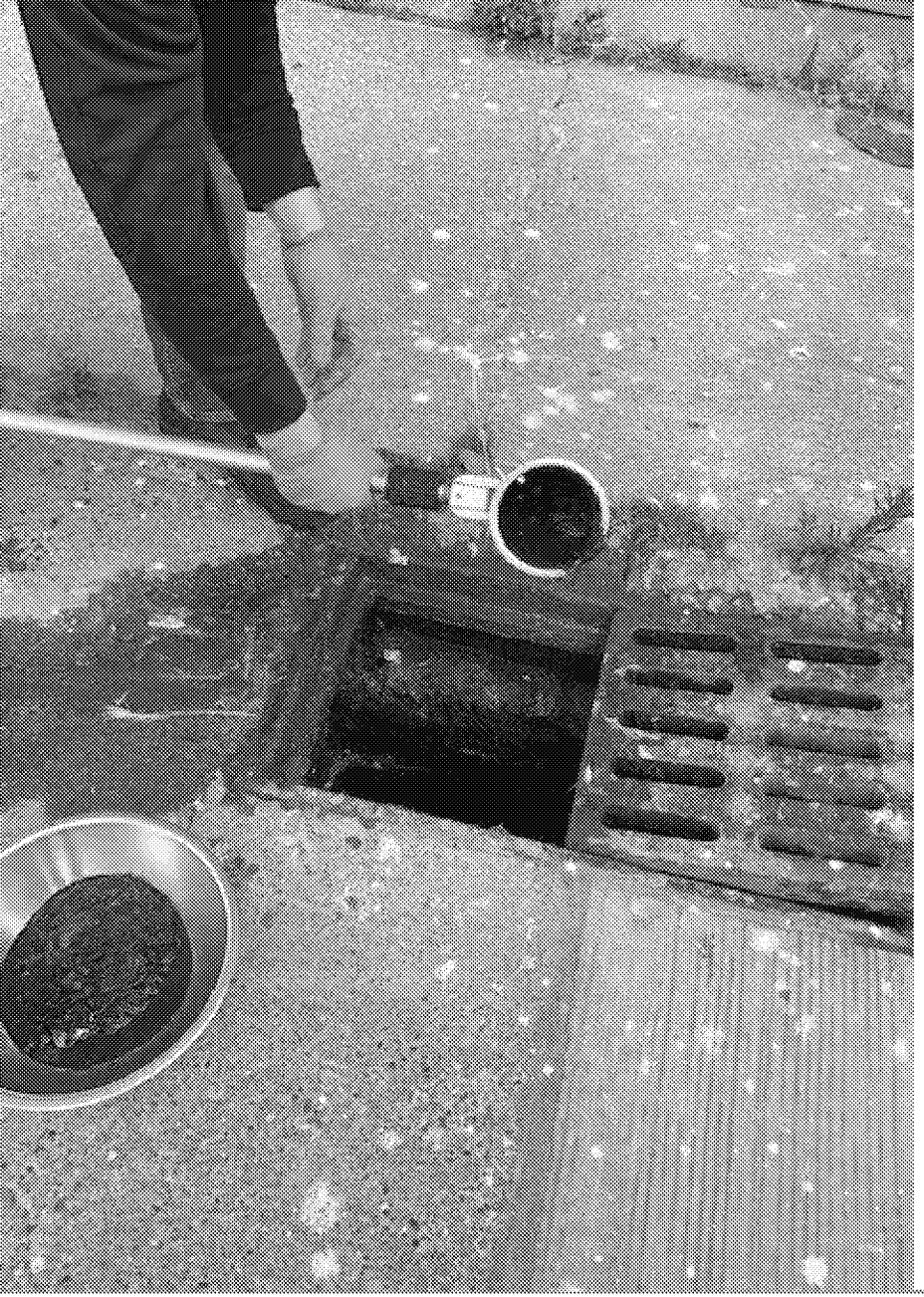
Ongoing Source Control Activities

- Clean Water Act / NPDES Monitoring and Control Requirements
  - Source tracing
  - Planned CSO control projects
    - Wet weather treatment
    - Storage
  - Municipal and industrial stormwater management
    - Inspections, operations, maintenance and monitoring
    - BMPs (sweeping, line cleanouts, catch basin cleanouts)
    - Treatment systems
    - Spill response

Ongoing Source Control Activities (cont.)

- King County Industrial Waste Program
- Local Hazardous Waste Management Program
- Air quality programs
- Upland cleanups (CERCLA/MTCA)
- Cleanup site-driven source investigations and sufficiency determinations

Data Summaries



Drainage System Sampling Methods

- Inline sediment traps
  - Traps left in place for months
- Inline solids grabs
  - Sampling of accumulated solids within the storm drain or CSO drainage lines/pipes
- Catch basin solids grabs
  - Sampling of accumulated solids in an on-site or right of way catch basin

Summary of LDW CSO and SD Solids

COC	Screening	n	Median	Mean	90th PCTL
Total PCB Aroclors (µg/kg)	all samples	379	105	503	736
	exclude samples > 2,000	358	97	196	507
Dioxin/furan TEQ (ng/kg)	all samples	57	29	117	158
	exclude 2 extreme values (886 and 3,160 ng/kg)	55	22	48	93
Arsenic (mg/kg)	all samples	351	10	18	26
	exclude samples > 57	343	10	12	23

Source: Windward 2020

Summary EW CSO and SD Solids (FS Data)

COC	Screening	n	Median	Mean	90th PCTL
Total PCBs (ug/kg)	CSOs	26	237	262	627
	SDs	137	55	254	454
	All	163	64	255	518
Dioxin/furan TEQ (ng/kg)	CSOs	4	8	16	37
	SDs	9	12	27	53
	All	13	12	23	46
Arsenic (mg/kg)	CSOs	26	6	5	9
	SDs	131	9	10	20
	All	157	7	9	20

Source: Anchor QEA 2019

Additional Solids Data Collected Since the EW FS cut-off date (2012)

- Combination of traps, in-line solids, and catch basins collected from 2013 to the present
- 98 samples – PCBs and arsenic
- 7 samples dioxins/furans
- Considerations
  - Line cleaning and source control activities
  - Potential sources

LDW Bed

LDW Bedded Sediment

COC	Screening	SWAC	95 UCL
Total PCBs (ug/kg)	Baseline (2018)	172	209
	Predicted Post-Construction (Year 25)	44	n/a
Dioxin/ furan TEQ (ng/kg)	Baseline (2018)	8.3	12
	Predicted Post-Construction (Year 25)	4.4	n/a
Arsenic (mg/kg)	Baseline (2018)	12	13
	Predicted Post-Construction (Year 25)	9.2	n/a

- Baseline composite samples provide post-Early Action Area cleanup and prior to EPA ROD cleanup Post-Construction (FS; AECOM 2012)
- Conditions (DER; Windward 2020)

Dataset Sufficiency Meeting

What information is needed from EWG for the dataset sufficiency meeting #5?

- Green River
- Laterals
- LDW Bed